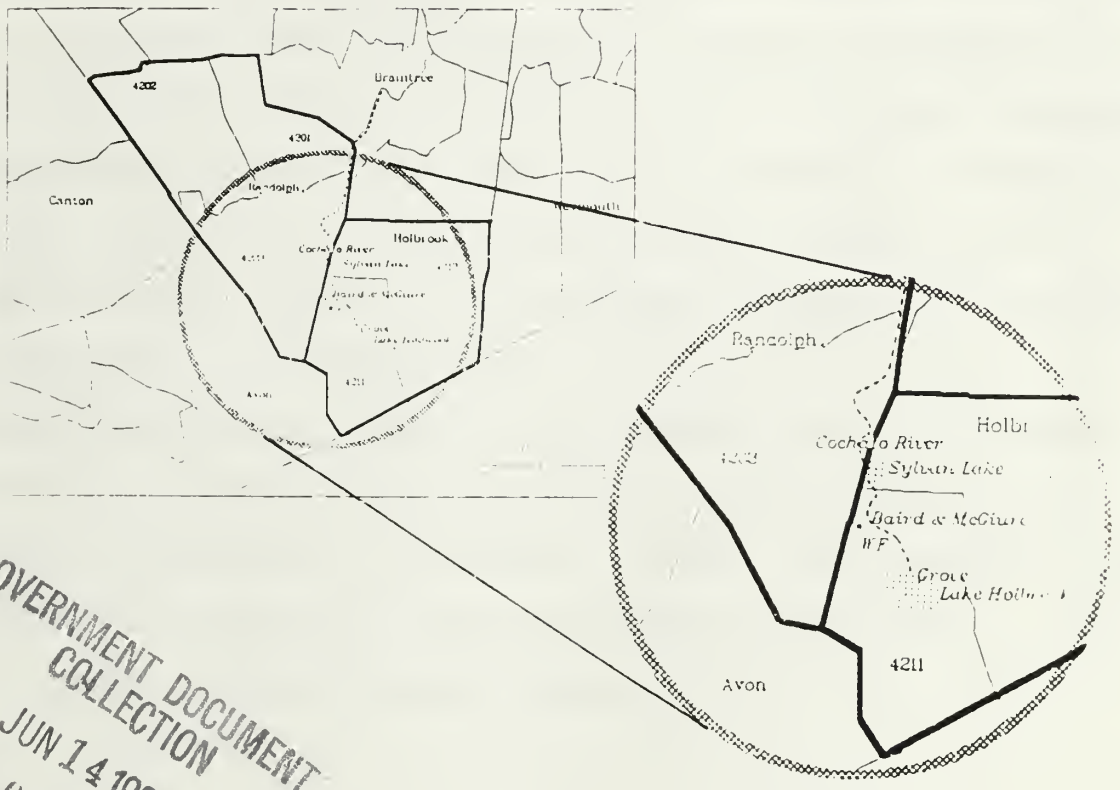
BAIRD AND MCGUIRE HEALTH ASSESSMENT

INFORMATION BOOKLET



This information booklet was prepared by the
Division of Environmental Health Assessment
Massachusetts Department of Public Health
150 Tremont St. Boston, MA 02111

Health Assessment
For
Baird and McGuire
Norfolk County
Holbrook, Massachusetts

Draft
Public Comment

Executive Summary

BACKGROUND

The Agency for Toxic Substances and Disease Registry (ATSDR) was mandated by the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended, to conduct health assessments for all Superfund hazardous waste sites in the country. In 1987 the Massachusetts Department of Public Health (MDPH) entered into a cooperative agreement program with the federal ATSDR to conduct these health assessments in Massachusetts.

The MDPH notified the public of its intent to conduct a health assessment for the Baird and McGuire site during a meeting with the Holbrook Board of Selectmen on November 2, 1989. The meeting was attended by members of the Citizens Task Force and the general public. This document is a final draft for public comment.

INTRODUCTION

A variety of health and environmental information has been reviewed for purposes of the health assessment. In addition, review of information at the local level and discussions with community representatives have taken place. The Baird and McGuire site is located near the Cochato River in Holbrook, Massachusetts around 400 feet east of the town of Randolph.

Contamination associated with the site consists of numerous compounds including arsenic, various insecticides and herbicides, volatile organic compounds, constituents of creosote, and a dioxin, 2,3,7,8-TCDD (which is a common contaminant of the herbicide 2,4,5-T). Contamination was detected in soils, ground water, and sediments at the site. The Cochato River contained contaminated sediments and fish. At the South Street municipal wellfield, contamination was detected below the water table in both the soils and ground water.

Community health concerns have been expressed with regard to the children who played at the site and the residents who may have ingested contaminated drinking water. Health impacts alleged by community members as being associated with exposure to the site's contaminants are: (1) various types of cancer and other chronic diseases in individuals who played at the site as children, and (2) perceived increases in overall cancer incidence and reproductive problems in nearby residents.

A review of medical and scientific data indicate that a variety of adverse health outcomes could potentially be related to the site. A complete discussion of these outcomes is included in the draft report, however, of particular interest was the effects of a number of contaminants on the immune system, and, a suggested relationship with non-Hodgkin's lymphoma incidence and exposure to 2,4-D. It should be emphasized that the health assessment can only provide information on what may have happened in the past. Similarly, if an exposure to the site was deemed possible or likely, important information on the "dose" (or intensity) of the exposure cannot be learned.

METHODS

Previous studies by DPH and others have lacked sufficient environmental and health outcome data to determine whether or not an environmental health problem existed among residents of Holbrook and Randolph. For purposes of this assessment, a descriptive epidemiologic study was conducted by the MDPH. Available cancer incidence data were examined for the two town area (1982-86). Standardized Incidence Ratios adjusted for age and sex were calculated for cancers of the stomach, liver, pancreas, lung, hematopoietic/reticuloendothelial systems (i.e., leukemia and multiple myelomas), bladder and kidney. Hodgkin's disease, non-Hodgkin's lymphoma, soft tissue sarcoma, adrenal cancer, malignant melanoma, and brain cancer were also considered in the analysis. The study encompassed the towns of Holbrook and Randolph, but also concentrated on the two census tracts closest to the Baird and McGuire site (census tracts 4211 in Holbrook and 4203 in Randolph) since they are more likely to have received contaminated South Street well water.

RESULTS

Populations with the greatest potential for past exposure to site-related contaminants are the company's workers, children who played at the site, nearby residents who received drinking water from the South Street wellfield, and recreational fishermen and their families. Although past exposures probably occurred, the chemicals and dosages are hard to determine because of the lack of monitoring data prior to the interim remedial activities. Due to a lack of information on the water distribution system, it is not completely known which residents received

the contaminated municipal drinking water nor how much they received, however, residents in CT 4211 and 4203 are most apt to have received this water.

Non-Hodgkin's lymphoma among females in census tracts 4211 in Holbrook and 4203 in Randolph was statistically significantly elevated compared to the state as a whole.

Significant elevations in non-Hodgkin's lymphoma incidence were not observed among either sex in the remaining one Holbrook and two Randolph census tracts. Examination of residential and occupational histories of the 22 non-Hodgkin's lymphoma cases in the two census tracts closest to the site indicates that most cases were longterm residents (>10 years) and that 55% listed occupation as housewife. Significant elevations were also noted in lung, kidney and bladder cancer, however, examination of smoking status and/or occupational data indicated that these two risk factors were likely to have played a major role.

DISCUSSIONS/CONCLUSIONS

Although a causal relationship with the Baird and McGuire site cannot be determined from this study, concern arises because of several observations: (1) residents in these two census tracts, especially 4211 in Holbrook, are most likely to have received municipal water from the South Street wellfield; (2) several compounds, including the herbicide 2,4-D, which are suspected of being associated with non-Hodgkin's lymphoma occurrence, have been detected in the subsurface soils at the Baird and McGuire site; and (3) low levels of these compounds have been detected below the water table in the South Street wellfield crossgradient from the site (under natural ground water flow conditions).

Current contaminant exposures are limited because of the interim remedial measures, the fencing of the site, site security, and the closure of the South Street wells; therefore, the potential for health impacts from current exposures is less likely. The extent the Cochato River and the associated lakes are used as a fishery is unknown. In addition, the fish monitoring data are limited. The possible health impact from consumption of Cochato River fish cannot be determined at this time.

Due to the current elevations in lung cancer incidence in Holbrook and Randolph, the emission of small sized particulates containing arsenic during remediation would be a concern if appropriate engineering controls are not implemented. Evidence indicates that the inhalation of particulate arsenic has a multiplicative effect on the development of lung cancer in cigarette smokers, and the majority of the lung cancer incident cases (93%) for which smoking status was reported were current or former smokers. It should be emphasized however that the potential for developing lung cancer should be reduced due to the conservative maximum stack emission level and the use of engineering controls.

RECOMMENDATIONS

Based on the available information, this site currently poses a public health concern largely resulting from past exposures. As a result of this, a number of recommendations have been made. Most importantly a follow-up health study will be designed by the Division of Environmental Health Assessment in collaboration with the State Laboratory Institute to determine whether or not the health of residents of census tracts 4211 and 4203 has been adversely impacted as a result of potential environmental exposures. This site will also be considered by ATSDR for inclusion in a

multi-site study utilizing biomarkers to evaluate the health impact of the site. In addition, a community health education program should be developed to discourage cigarette smoking. Guidance on how to develop a community program will be provided by the MDPH to the local boards of health. Finally, a physician education program should be developed, so that, the local medical community will know how people might have been exposed to contamination from the site and what health effects might occur. This activity will be conducted by the MDPH. ATSDR will provide resource information for both programs.

FOR PUBLIC COMMENT

The document can be reviewed at either the Holbrook or Randolph town libraries. To obtain the document or an information booklet, contact the MDPH Division of Environmental Health Assessment at (617) 727-7170. Comments should be submitted to the following address by December 1, 1990.

Attention: Eileen Furlong
Division of Environmental Health Assessment
Massachusetts Department of Public Health
150 Tremont Street
Boston, MA 02111

QUESTIONS ABOUT THE HEALTH ASSESSMENT

1. Q. What is a health assessment?

   A. A health assessment is a process used to determine the possibility of adverse public health impacts from past, current, and future exposures to contaminants from a Superfund site. Information about environmental exposure(s), toxicology of the contaminants, the available health outcome data for the community (such as cancer incidence data), and the community's health concerns are used to determine the level of concern for the site. The types of recommendations for follow-up activities are based on the level of concern.

2. Q. Why was the health assessment done for the Baird and McGuire site?

   A. The federal Agency for Toxic Substances and Disease Registry (ATSDR) was mandated by the Comprehensive Environmental Response, and Liability Act of 1980 (CERCLA), as amended, to conduct health assessments for all National Priority List (Superfund) hazardous waste sites in the country. In 1987 the Massachusetts Department of Public Health (MDPH), Division of Environmental Health Assessment, entered into a cooperative agreement with the ATSDR to conduct these health assessments in Massachusetts. The workplan for FY-90 included the Baird and McGuire site as one that needed to be performed.

3. Q. Why is the health assessment a "draft" document?

   A. The Baird and McGuire Health Assessment was released as a draft document in order to solicit important public comments. An important part of the health assessment process is considering public health and environmental concerns about a Superfund site. The public comment period allows more public involvement in the process, and ensures, to the extent possible, that all public health concerns are addressed.

4. Q. What is the Baird and McGuire site and what types of contaminants are present?

   A. The Baird and McGuire site is located at 775 South Street in Holbrook, Massachusetts. The site is the location of a former chemical company involved in mixing and batching operations, and operated from 1912 until 1983. A number of chemicals were prepared for commercial use. Hazardous substances processed include insecticides, herbicides, creosote, and arsenic. In 1982 the site was added to the National Priority List (NPL) for hazardous waste sites due to the extensive environmental contamination.

5. Q. Who was exposed to the Baird and McGuire site contamination and how did exposure likely occur?

A. The largest number of potentially-exposed people were the consumers of drinking water originating from the South Street municipal wellfield. The municipal wells operated from the mid-1950's until 1983. Contaminants were detected in the wellfield as early as 1959. The actual homes serviced by this wellfield are unknown and probably varied with time. However, homes in census tract (CT) 4211 in Holbrook and CT 4203 in Randolph likely received most of this water. With few exceptions, the actual chemicals in the drinking water and their levels are unknown. Other smaller-sized populations that probably were exposed are the individuals who played near the site as children and the former Baird and McGuire workers.

6. Q. What are the major health findings of the health assessment?

A.
* Non-Hodgkin's lymphoma was significantly elevated for females in CT 4211 in Holbrook, CT 4203 in Randolph, and, especially, both census tracts combined when compared to the state. Most non-Hodgkin's lymphoma cases were long-term residents of one of the two census tracts that had the greatest potential for exposure.

* This health assessment cannot be used to determine whether or not the Baird and McGuire site caused the elevations in non-Hodgkin's lymphoma incidence. However, concern arises primarily because of two reasons. First, residents of these census tracts are most likely to have received municipal water from the South Street wellfield. Second, based on the scientific literature, several Baird and McGuire contaminants are suspected of being associated with non-Hodgkin's lymphoma.

* Statistically significant elevations were observed in overall lung cancer incidence for both towns of Holbrook and Randolph. Most lung cancer cases were current or former cigarette smokers. Therefore, life-style factors appear to have played a role in lung cancer development.

* Future remediation may result in the emission of small-sized particulates, which may contain arsenic. Particulate release will be minimized because remediation will occur over a short duration and engineering controls will be used. Inhalation of arsenic may increase the risk of cigarette smokers developing cancer.

7. Q. What, if any, follow-up activities does the state recommend?

   A. (1) The MDPH Division of Environmental Health Assessment together with the MDPH Laboratory will design a follow-up health study to determine whether or not the health of residents of census tracts 4211 and 4203 has been adversely impacted as a result of the environmental exposures that probably occurred in the past. The division will then seek funds to conduct this study.

   (2) A physician education program should be developed, so that, the local medical community will know how people might have been exposed to contamination from the site and what health effects might occur. This activity is being conducted by the MDPH.

   (3) A community health education program should be developed to discourage cigarette smoking and to further reduce the potential for interaction between cigarette smoking and inhalation of arsenic in the development of lung cancer. Guidance on how to develop a community program will be provided by the MDPH to the local boards of health. ATSDR will provide resource information for both programs.

8. Q. Is there an exposure occurring today that could affect my health? Should I move from census tract 4211 or 4203?

   A. The South Street wells have been closed since 1982. A number of short term remedial activities have occurred at the site. In addition, the current remediation plans for permanent site cleanup include monitoring systems and engineering controls that will minimize exposures. There is little risk today or in the future to the general public.

9. Q. How do I know if I have been exposed to contaminated drinking water?

   A. The exact homes that received South Street drinking water are unknown. However, the homes located in census tract 4203 in Randolph and, especially, census tract 4211 in Holbrook are most apt to have received their water from this source. The water delivered to a home could be a mix of water from the South Street wellfield and the other water supplies. The proportion of water due to the South Street wellfield would vary with time, and would depend upon the amount of water supplied by each of the water sources, consumer demand, and the municipal water distribution system. In addition, the presence of each contaminant and its concentration in the water could also vary with time.

10. Q. I lived in census tract 4211 or 4203 while the South Street wells were operating, and have been experiencing immune problems (or any other health effect). Was this caused by contamination from the Baird and McGuire site?

A. It is not possible to determine whether or not a person's disease or symptoms are actually the result of exposure to the Baird and McGuire site. The health assessment cannot determine cause and effect. A number of uncertainties exist that make this determination difficult. Uncertainties include the proportion of South Street well water delivered to any one home and the amount of contaminants in the water. Most environmental exposures are long term, low dose exposures to a large number of contaminants. Scientific information for health outcomes following environmental exposure is limited at this time. The occurrence of a health outcome would depend on how the toxicity of the various chemicals interact in the human body, the exposure dose, at what dose the outcome might occur, and a person's sensitivity to the exposure. The various outcomes listed in the health assessment are the ones that suggest a potential relationship based on the best scientific and medical information available at this time.

11. Q. I have lived in census tract 4211 or 4203 all my life, and have no health problems. Am I at risk of developing health problems?

A. It is impossible to determine the effect the contamination from the Baird and McGuire site or the South Street well water has on any one person's risk of developing health problems. However, the well field contains contaminants which may be toxic.

12. Q. What can I do to determine if I have non-Hodgkin's lymphoma?

A. You should consult your physician, and let him/her know that you believe you are a member of a population at risk of developing non-Hodgkin's lymphoma. In addition, scientific researchers have identified a genetic marker that may exist in patients with a specific type of non-Hodgkin's lymphoma. Investigators at the MDPH are currently exploring the possibility of using this marker as part of a follow-up study.

13. Q. My son/daughter played near the Baird and McGuire facility as a child. Does he/she have an increased risk of developing cancer?

A. Because the children who played near the facility may have received high doses of contamination, your child may be a member of a potentially high risk population. Whether or not any individual person is at an increased risk is impossible to say, because it would depend on how frequently the child went near the site, what types of activities the child did that might have influenced exposure, and the characteristics of any contaminated material.

14. Q. I am a former smoker. Am I at an increased risk of developing lung cancer from inhalation of arsenic?

A. Evidence suggests that arsenic has a multiplicative effect on the development of lung cancer in cigarette smokers. No information is available on the actual effects of arsenic exposure on former smokers.

15. Q. I smoke cigarettes. If I stop smoking now, will my risk of developing lung cancer be reduced?

A. The Federal Office of Smoking and Health estimates that, in the United States, cigarette smoking accounts for 95% of lung cancer deaths in males and 80% of lung cancer deaths in females. Cessation of smoking will definitely reduce your risk of developing lung and other cancers.

16. Q. How do I submit comments or obtain more information.

A. Send a written copy of any comments to the attention of:

Eileen A. Furlong
Division of Environmental Health Assessment
Massachusetts Department of Public Health
150 Tremont Street Boston, MA 02111

For more information, call the division at (617) 727-7170. The public comment period ends on December 1, 1990.